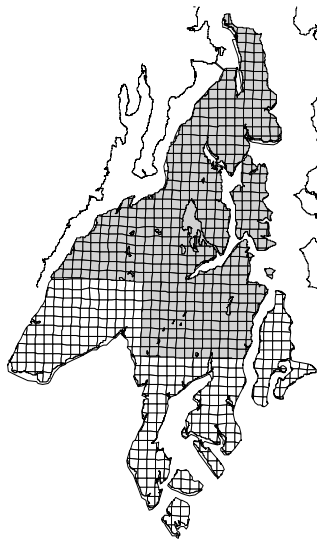


Kitsap County Initial Basin Assessment

October 1997

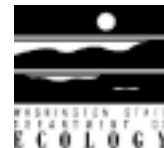
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Section 5

Hydrogeology

5.1 General Hydrogeology

The general geology, hydrogeology, and water resources of Kitsap County have been described by others (Sceva, 1954, Garling, 1965). Much of the discussion in this section is excerpted from the Kitsap County Ground Water Management Plan (GWMP); Volumes I and II (EES, et al., 1991). Kitsap County (County) lies in the center of the Puget Sound Lowland (Lowland). The Lowland lies between the Olympic Mountains to the west and the Cascade Range to the east. The Lowland is part of a large glacial drift plain formed by multiple glaciations over the area. This history of complex glacial erosion and deposition events, separated by long periods of non-glacial deposition, has created a very complex mixture of unconsolidated sediments beneath the area. This sediment blanket ranges in thickness from zero to over 3,600 feet. It overlays an irregular bedrock surface which is exposed in the central and eastern portions of the county on south Bainbridge Island, Bremerton, Port Orchard, and the Green and Gold Mountain highlands.

The majority of ground water in the County is contained in the unconsolidated sediments. A conceptual model of unconsolidated sediments is depicted in [Exhibit 5-1a](#), a generalized hydrogeologic cross-section for the County. The exhibit shows a layered system of water-bearing units (aquifers) and low permeability units which retard water flow (aquitards). For the purpose of simplification, aquifers and aquitards are generalized into regionally extensive units. In actuality, textural variability within the units may result in a more complex assemblage of interfingering aquifers and aquitards occurring on scales ranging from regional to local. [Exhibit 5-1b](#) provides nomenclature and regional correlation of the associated stratigraphy.

The ground water flow system is recharged by precipitation falling on the land surface. Precipitation also becomes surface runoff to the County's rivers and streams, evaporation from above-ground surfaces, and transpiration from plants that intercept water infiltrating the root zone. Ground water recharge is areally distributed throughout the county, whereas ground water discharge is concentrated around surface-water features such as streams, rivers, lakes, wetlands, and marine bodies. Discharge tends to occur at lower elevations to both surface water and springs, but also occurs to wells regardless of their location.

Ground water flow within aquifers is predominantly horizontal, beginning at recharge areas and flowing towards discharge areas. Ground water flow between aquifers is predominantly vertical, and typically much slower due to the lower permeability of aquitards. In portions of Kitsap County, uppermost (shallow) aquifers are commonly "perched" above aquitards and local in areal extent. Perched conditions occur where unsaturated sediments separate the bottom of the aquitard from the regional water table below. Ground water in perched aquifers reaches deeper aquifers either by slowly percolating through the underlying aquitard or by flowing (more quickly) around its edge. The deeper sediments are typically fully saturated, especially below